

Health & Safety Manual

Supplement 26.21

Roof Access Procedure

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Approved by the ES&H Working Group

_____ date _____

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Roof Access Procedure*

Contents

1.0	Introduction	1
2.0	Applicability	1
3.0	Process for Risk Reduction	1
3.1	Building Classifications	1
3.2	Authorization Criteria for Roof Access.....	2
3.3	Maintenance Window	3
3.4	Response to Emergency or Abnormal Conditions	3
3.5	Accessing LLNL Facilities Under Normal Conditions	3
3.5.1	Type A Facilities.....	3
3.5.2	Type B Facilities	4
3.5.3	Type C Facilities	4
3.6	Sign In/Out Procedure.....	4
3.7	Time Limit of Permit.....	5
3.8	Access During Off Hours.....	5
4.0	Responsibilities.....	5
4.1	Roof Requesters	5
4.2	Building Representative	6
4.3	ES&H Team.....	7
4.4	Building Occupants	8
4.5	Facility and Line Managers.....	8
4.6	Plant Engineering Management.....	8
5.0	LLNL Contacts.....	9
Appendix A	Responsibilities for Roof Access	11
Appendix B	Roof Access Classification Criteria and Signs.....	13
Appendix C	LLNL Roof Access Permit.....	15

Roof Access Procedure

1.0 Introduction

Laboratory and non-Laboratory personnel are often required to access the roofs of LLNL structures to collect samples; install equipment; and perform routine maintenance, repairs, and modifications. These individuals may be exposed to various hazards. For example, roof-top stacks have the potential to exhaust gases, fumes, and particulates from chemical hoods, hot water boilers, building sewer systems, and glove boxes. Other potential hazards include individuals falling through skylights or from roofs or access ladders and being exposed to ionizing and nonionizing radiation, electrical shock, and shrapnel from experiments.

Because of these possible hazards, detailed roof access procedures are required to minimize the potential for injury.

This supplement contains the following:

- Requirements for accessing the roofs of all structures owned or operated by LLNL at Livermore and Site 300.
- Methods for accessing the roofs of LLNL structures.
- Responsibilities of individuals who manage or access the roofs of LLNL structures. See also Appendix A, "Responsibilities for Roof Access."

The guidelines in this supplement shall be used as a minimum. Any deviations from or addition to the requirements shall be included in the facility safety procedure (FSP) or other formal documentation specifying ES&H controls.

2.0 Applicability

All activities and individuals who require access to the roofs of LLNL structures shall comply with the requirements in this supplement.

3.0 Process for Risk Reduction

3.1 Building Classifications

The three types of roof access classifications for LLNL buildings are Types A, B, and C; their criteria are given in Appendix B. A graded approach was used to establish these classifications. Access to buildings with Types A and B classifications requires a Roof Access Permit (see Appendix C) and the appropriate sign(s) (Appendix B, Fig. B-1) at all roof access doors and ladders.

Type A. These facilities are designated as “restricted access” because exposure exceeding accepted criteria or unsafe conditions may occur. Before accessing the roofs of these facilities, planned work must be reviewed and a written permit must be obtained.

Type B. These facilities are designated as “limited access” because safety and health hazards may be encountered. Before accessing the roofs of these facilities, planned work must be reviewed and a written permit must be obtained.

Type C. These facilities are designated as “general access.” Verbal approval from the building representative (building coordinator, facility manager, or designee) is required to access the roofs of these facilities.

Roof access classifications are determined by the Facility Manager and the ES&H team leader and are reviewed annually. All classifications for LLNL buildings are kept by the ES&H team providing support for the building. To obtain a copy, contact the ES&H representative for the building.

3.2 Authorization Criteria for Roof Access

The following factors, though not all inclusive, are important and should be considered before granting roof access:

- Experiments and/or processes in the facility that may pose a danger to workers on the roof (e.g., those involving toxic and/or radioactive materials, chemicals, explosives, or pressure). Before roof access is allowed, the building’s exhaust system shall be evaluated to ensure that personnel are not exposed to unacceptable levels of airborne contaminants.
- Possible exposure of workers to hazardous effluents from other (upwind) facilities.
- The types, quantity, and congestion of roof-mounted equipment; accessibility of the roof; and the level of difficulty in applying standardized maintenance techniques.
- Weather and meteorological conditions (e.g., a worker downwind of a stack may be exposed to much higher levels of airborne contaminants than someone upwind and under certain weather conditions, such as extreme inversion, roof access may be inappropriate).
- The type and availability of safety equipment necessary to safely access the roof.
- Route and location restrictions under certain conditions to limit unnecessary worker exposure to potential hazards.

The building representative and area ES&H team must concur with the conditions under which the roof may be safely accessed. *Under no circumstances shall anyone access a roof for routine operations using an extension ladder; elevated work platforms; or standard, fixed-roof ladders without first obtaining approval from the building representative.*

3.3 Maintenance Window

The Maintenance and Operations Department's "Maintenance Window Program" is designed so that required maintenance is performed on a facility within a preagreed-upon time frame. This program requires close coordination and cooperation between facility owners, building residents, and maintenance and operations crafts personnel. The Roof Access Permit will cover all the crafts for a 24-hour, single calendar day period during a Maintenance Window. A new permit must be issued every day.

To ensure the safety of crafts personnel involved in a Maintenance Window effort, all the requirements of this supplement (except for the 4-hour permit renewal requirement discussed in Section 3.7) must be followed when issuing Roof Access Permits. In addition, a log shall be kept of all personnel on the roof.

3.4 Response to Emergency or Abnormal Conditions

Below are conditions that may require prompt action by individuals who work on roofs.

- General facility evacuation; responses to fires, spills, or critical situations; or the release of toxic material.
- Exposure to materials inside ventilation ducts, sudden illness, job-related injuries, or other similar situations that require emergency response.

Should these or any other situation demand an emergency response, workers should immediately call the emergency dispatcher (911). The building representative shall be notified of all situations that warrant an emergency response.

3.5 Accessing LLNL Facilities Under Normal Conditions

3.5.1 Type A Facilities

The following are required before accessing the roofs of all Type A facilities:

- A hazard evaluation of all operations and systems in the facility that may affect worker safety on the roof.

- An approved Roof Access Permit. Individuals requesting access, the building representative, and the health and safety technician shall complete the appropriate section on the permit. A Roof Access Permit can be modified only after the building representative, health and safety technician, and crafts personnel have discussed and agreed to the change.
- Caution signs, such as that below, are to be placed on the hoods of local exhaust systems and other equipment that are potentially hazardous to roof-top workers and in all areas affected by roof-top work. The affected area is defined by the building representative.
- Implementation of the sign-in requirements described in Section 3.6.

<p style="font-size: 1.5em; font-weight: bold; margin: 0;">CAUTION</p> <p style="font-size: 1.2em; font-weight: bold; margin: 10px 0;">WORKERS ON ROOF</p> <p style="font-weight: bold; margin: 10px 0;">DO NOT OPERATE HOOD/EQUIPMENT POSTED WITH THIS SIGN</p> <p style="margin: 10px 0;">DATE: _____</p> <p style="margin: 10px 0;">_____ Signature of Building Representative</p>

3.5.2 Type B Facilities

All the requirements for accessing the roofs of Type A facilities are applicable to Type B. The difference between Type A and Type B facilities is the potential risk to personnel working on the roof.

3.5.3 Type C Facilities

Only ordinary hazards associated with working at heights are present in Type C facilities; therefore, approval from the building representative is sufficient.

3.6 Sign In/Out Procedure

Types A and B facilities shall have a white board, logbook, or chalkboard for each worker to sign in and out when accessing or vacating roof tops. These devices shall be placed at the roof access point or other central location.

3.7 Time Limit of Permit

Permits are issued to cover either morning or afternoon activities. A permit's duration will not extend beyond 4 hours unless an exception is agreed to by the facility manager and the craft supervisor. In all cases, it is the facility management's responsibility to ensure that facility personnel are aware when the Roof Access Permit is in effect.

3.8 Access During Off Hours

For emergency access to facilities during "off hours" (Monday–Thursday, 5:00 p.m. to 7:00 a.m.; and 5:00 p.m. Friday to 7:00 a.m. Monday), contact the off-shift Hazards Control health and safety technician via the Fire Department dispatcher (ext. 2-7595) and the appropriate building representative (if available) for the required review and approval.

Other off-hours access (non-emergency) shall follow the procedure given in this supplement. Whenever a Roof Access Permit is in effect during off hours, a representative from the Hazards Control Department shall tour the facility twice during each 8-hour shift to ensure conditions remain stable.

4.0 Responsibilities

4.1 Roof Access Requesters

In accordance with Section 3.5, workers who need to access the roofs of LLNL facilities shall do the following:

- Complete the appropriate section on the Roof Access Permit (see Appendix C).
- Identify the equipment to be worked on.
- Contact the building representative for prior approval.
- Work only in the area of the roof described on the permit.
- Obtain a new Roof Access Permit if a change is needed in the roof access area.
- Review the permit, hazards associated with the building, and the roof access procedures with individuals accessing the roof.
- Bring their own fall-protection equipment for use when working within 6 ft of an unguarded roof edge or unprotected skylight.

- Not remove any building materials without prior approval of the building representative.
- Leave the roof and report to the building representative in the event of an emergency or abnormal condition.
- Notify the building representative if the area will be temporarily vacated for more than an hour.
- Notify the building representative when the work is completed.

4.2 Building Representative

The building representative shall do the following:

- Inform personnel who will be working on roofs of the proper responses to building-specific evacuation alarms, and where to assemble so that they can be accounted for if the building is evacuated.
- Know the classification of the building and whether a Roof Access Permit is required.
- Keep a supply of Roof Access Permits on hand.
- Establish positive measures to control access to the roofs of Types A and B facilities.
- Request that a health and safety technician review proposed activities for roof access requirements, the necessary safety controls, and the type of signs required.
- Be aware of the hazards in areas of the roof where individuals need to work; communicate these hazards to all persons accessing those areas.
- Determine the areas (rooms and/or lab hoods) within the building where caution signs must be posted. In addition, ensure the correct signs are posted and that the appropriate building personnel are notified.
- Establish a method to inform building occupants that workers are on the roof.
- Verify that anyone who accesses a roof has a permit or verbal authorization.
- Control all building materials that are removed from service (e.g., potentially contaminated equipment).
- Ensure that caution signs placed on hoods and equipment during roof access are removed when the work is completed.
- Notify the area ES&H team of any changes in materials used in buildings that may require re-evaluation of the building's roof access classification.

- Maintain the roof access logbook and the chalk or white board for Types A and B roofs.
- Notify the Protective Force Division of roof access activity, if necessary.
- Maintain a list of all hazards present in the facility such as hoods, microwave sources, or pressure systems that could affect workers on the roof.

4.3 ES&H Team

The ES&H team for the area shall do the following:

- Provide an annual evaluation of the roof access classification to the facility manager for LLNL buildings that the team supports. Re-evaluate the classification whenever facility operations change.
- Determine the requirements for each Roof Access Permit and the precautions for potential hazards at the facility.
- Review the Roof Access Permit for completeness and to ensure that the proposed work can be accomplished safely.
- Ensure that the Hazards Control off-shift health and safety technician receives orientation on roof access procedures.
- Specify any special protective clothing or safety devices needed during roof access.
- Conduct orientations on roof access requirements for Plant Engineering, other service organizations, service vendors, contractors, and building personnel upon request.
- Ensure that the appropriate member of the area ES&H team conducts an investigation when there is concern of exposure to hazardous or radioactive materials, or other safety concern.
- Determine a safe route to the work area on the roof.
- Identify areas where safety barriers are needed to protect workers who must perform routine tasks within 6 ft of a roof edge.
- Identify locations where lanyard or slide-wire attachments are needed for infrequent tasks performed within 6 ft of a roof edge if there is a hazard of falling from heights of 6 ft or more.
- Inspect roof access ladders to ensure they comply with OSHA requirements.
- Survey/swipe equipment as appropriate prior to removal.
- Keep a copy of the Roof Access Permit for one year.

4.4 Building Occupants

Building occupants shall do the following:

- Be familiar with, understand, and comply with roof access procedures.
- Comply with the required signs posted on hoods and rooms.
- Not resume work on equipment or in areas where signs are posted until notified or until these signs have been removed by an authorized individual.
- Ensure that chemicals, materials, and processes located inside hoods and exhaust enclosures are in a condition that does not present a hazard to personnel on the roof.
- Notify the facility manager and area ES&H team of any additions or changes in operations or materials used in the facility. (Introduction or removal of hazards may require a re-evaluation of the roof access classification.)

4.5 Facility and Line Managers

Facility and line managers shall do the following:

- Ensure that the procedures in this supplement are fully implemented and followed.
- Determine the roof access classification with support from the ES&H team.
- Ensure that building residents observe posted signs and restrictions, and that they are aware of roof access procedures.
- Notify the area ES&H team of any changes in operations or materials used in the facility that may require re-evaluation of the roof access classification.
- Notify the Safeguards and Security representative of any changes to roof access activities that may require notification of the Protective Force Division.
- Ensure that required safety barriers and/or fall protection equipment are available.

4.6 Plant Engineering Management

Plant Engineering management shall do the following:

- Ensure that all of its first-line supervisors read this supplement and review it with employees.
- Provide personnel who work on roofs with fall protection equipment when required.

5.0 LLNL Contacts

Questions or requests for additional information regarding any aspect of this supplement shall be directed to the following, as necessary.

- Maintenance and Operations Craft Superintendent, ext. 3-0457
- ES&H teams
- Safeguards and Security, ext. 3-9121
- Health Physics and Industrial Hygiene, ext. 2-1214
- Industrial Safety, ext. 2-1322
- Facility Managers

Appendix A

Responsibilities for Roof Access

Appendix B

Roof Access Classification Criteria and Signs

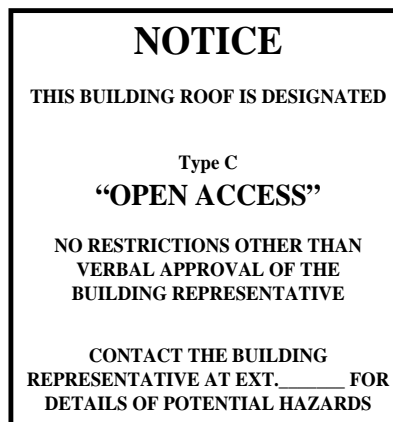
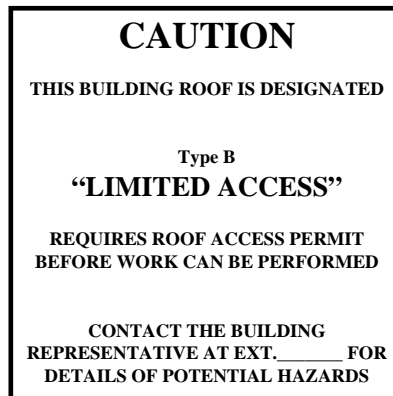


Figure B-1. Roof access signs for Types A, B, and C facilities.

Appendix C

LLNL Roof Access Permit

SECTION I <i>(To be completed by roof requester)</i>
Roof access requester: _____
Additional individuals: _____
Building number: _____ Date: _____ Time: _____
Reason for roof access: _____
Area of roof to be accessed: _____
Equipment to be worked on: _____
Roof area restrictions: _____
SECTION II <i>(To be completed by Hazards Control Department)</i>
Expiration time _____ ES&H team number: _____
Date/time authorization reviewed: _____
Hazards explained: _____
Special safety equipment required: _____
SECTION III <i>(To be completed by Building Representative)</i>
Signs placed on hoods? Yes: _____ No: _____
Signs placed on entrances/room? Yes: _____ No: _____
Signs removed? Date: _____ Time: _____
Equipment shut down: _____
Signatures
Roof access requester signature: _____
Hazard Control signature: _____
Building representative signature: _____

The area health and safety technician shall each keep a copy of the completed form for one year. See the reverse side for definitions of the terms used on this permit.

Roof access requester	Name of individual needing access to the roof.
Additional individuals	Names of other individuals also accessing the roof under this permit.
Building number	Building number of the roof to be accessed.
Date/time	Date/time of roof access.
Reason for roof access	The purpose for accessing the roof (e.g., to change the belts on fans or filters). Also include a description of the equipment on which maintenance or repair will be performed.
Area of the roof to be accessed	Description of the roof area where personnel intend to work. This can either be a part of or the entire roof. Any changes to the work intended will require a new Roof Access Permit.
Equipment to be worked on	List or name the types of equipment (e.g., ACU number).
Roof area restrictions	Areas that are designated as restricted because of potential hazards.
Expiration time	Time when permit to access roof expires.
Date/time authorization reviewed	Date and time that the permit authorization was reviewed by Hazards Control personnel. Approval of access is acknowledged by signature.
Hazards explained	Description of any hazards explained to personnel accessing the roof.
Special safety equipment required	Specify if safety glasses, respirators, gloves, or coveralls are required.
Signs placed on hoods	The signs placed on hoods explaining that roof work is being conducted.
Signs placed on entrances/ room	Room numbers where signs are placed explaining that roof work is being conducted.
Signs removed: date/time	Date and time that the signs explaining the roof work were removed from the hoods and rooms.
Equipment shut down	Either the equipment number or another description indicating that the equipment was shut down to perform roof work. If the equipment was not shut down, write "N/A."
Roof access requester signature	Signature of the individual who will access the roof.
Hazards Control signature	Signature of the area ES&H Team Leader or his/her designee.
Building representative signature	Signature of the building coordinator or facility manager, or his/her designee. In the Laser Program, this individual is referred to as the building safety coordinator; at Site 300 as the building supervisor. Signature of the building representative grants approval of roof access.

